

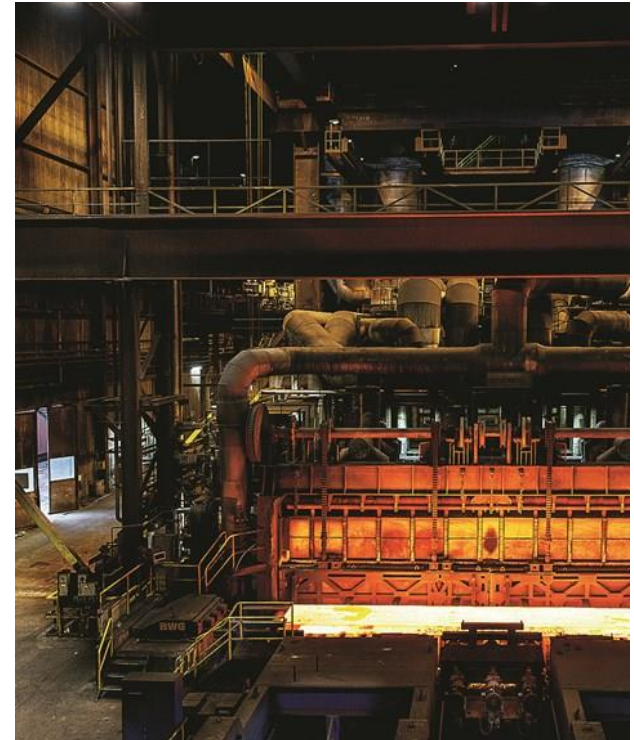
What is the status for biogas use in the industry?

Oslo 2019-04-09

**Linus Klackenberg,
Swedish Gas Association**

Content

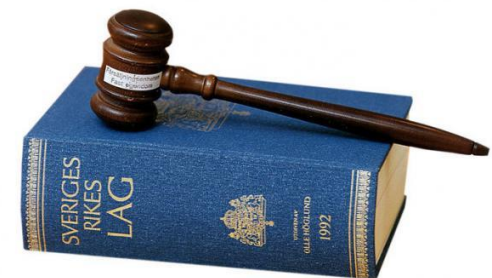
- **Visions & goals**
- **Gas in industry**
- **Biogas is coming!**
- **Examples**
 - Biogas use in industry
 - Biogas and industry in cooperation
- **Policies and barriers**
 - and solutions



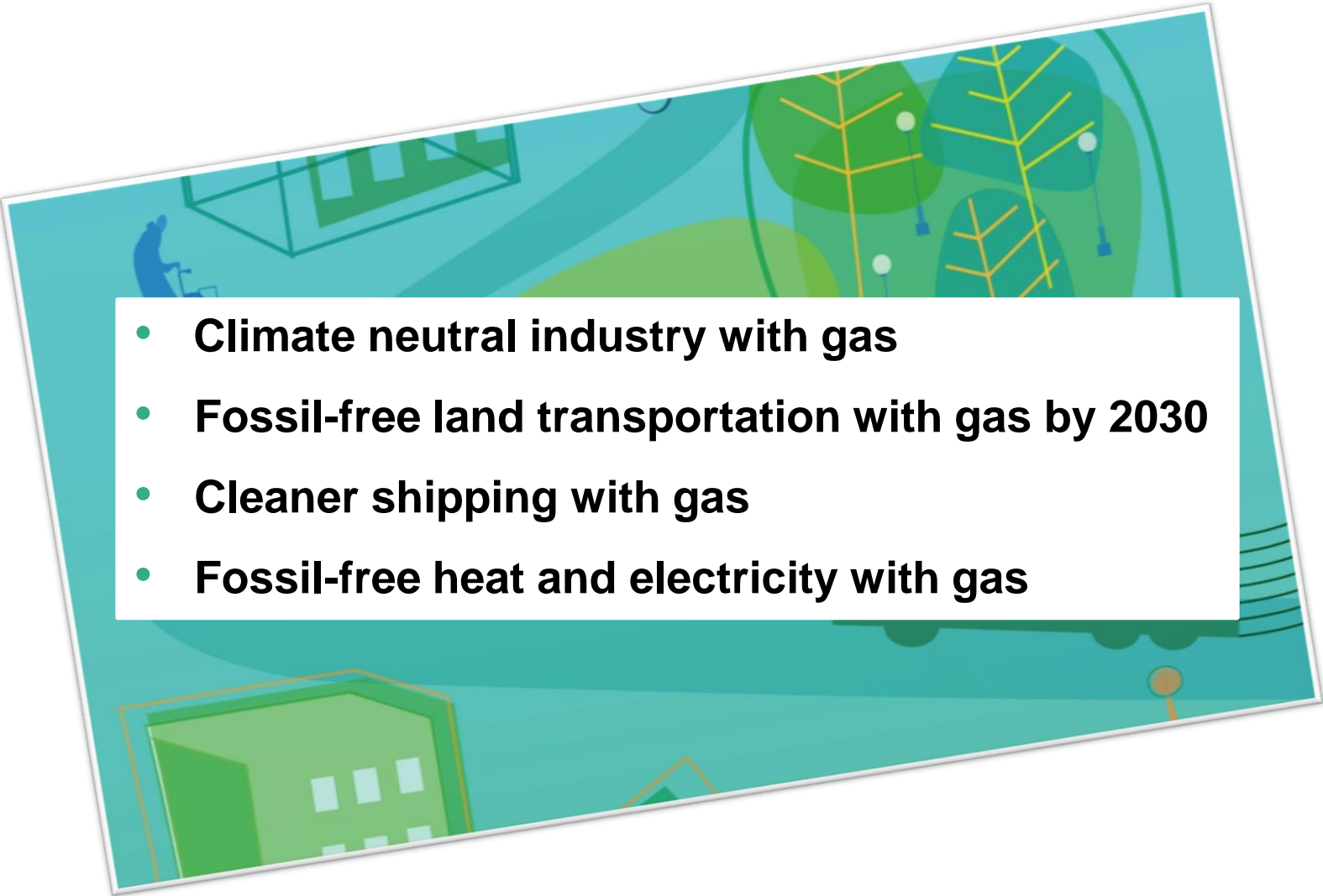
Sweden in transition

– new climate law

- **New climate policy framework from 2018**
 - Climate assessment of budgets, climate action plans & Climate Policy Council
 - By 2045, Sweden must have **zero** net greenhouse gas emissions
 - At least 63 % lower emissions outside the EU ETS by 2030 and 75 % lower 2040
 - By 2030, emissions from domestic transport, excluding aviation, must be at least **70 percent lower** than in 2010.



A vision "Green gas 2050"

- 
- **Climate neutral industry with gas**
 - **Fossil-free land transportation with gas by 2030**
 - **Cleaner shipping with gas**
 - **Fossil-free heat and electricity with gas**

Proposal of a National Biogas Strategy

Biogas – more important than ever

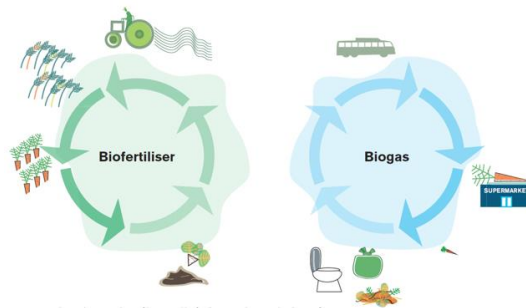
- UN:s Global Goals for Sustainable Development Biogas contributes positively to all 17 goals directly and indirectly



- Swedish National Environment Quality Goals Biogas contributes positively directly to 8 of 16 goals



Biogas is circular economy



...and has many social benefits

- Climate benefit
- Improved air quality
- Increased employment
- Increased security of supply and safety
- Plant nutrients in the cycle
- Less odour in agriculture
- Reduced noise
- Local and regional economic benefit

NATIONELL BIOGASSTRATEGI 2.0

A national goal of at least 15 TWh biogas use in Sweden 2030

BIOGAS GOAL 2030: 15 TWh

Transport sector 12 TWh
Industry 3 TWh



Ambitious goal which requires measures along the whole biogas value chain

NATIONELL BIOGASSTRATEGI 2.0

Important first step: 7 TWh biogas production

- According to scientists:
 - Wastes and residues available for which the environmentally best choice is digestion to biogas and biofertiliser = 7 TWh biogas
 - Gives biofertiliser corresponding to 10 – 15 % of today's mineral fertiliser use
- Next step?
 - Production potential > 20 TWh – including forrest residues



NATIONELL BIOGASSTRATEGI 2.0

Measures needed at many levels

- Swedish Government and Parliament
 - Taxing energy content instead of gas volumes
 - Mandatory collection of organic waste – with recovery of nutrients and energy
 - Develop the green gas principle (within EU ETS, green electricity certificates and taxes)
 - Promote large-scale production of biofuels from cellulose
 - Investment fund for cleaner shipping
 - Implement measures for the conversion of the vehicle fleet – promote gas vehicles and other climate-adapted vehicles
 - Promote large-scale introduction of low-carbon lorries
 - Promote gas-powered buses and ferries in public transport
 - Instruments to reduce the export of used "climate bonus cars"
 - Promote climate bonus vehicles in taxation (within the travel deduction system and as a benefit car)

Equal terms
Long-term conditions

NATIONELL BIOGASSTRATEGI 2.0

A national goal of at least 15 TWh biogas use in Sweden 2030

BIOGAS GOAL 2030: 15 TWh

Transport sector 12 TWh

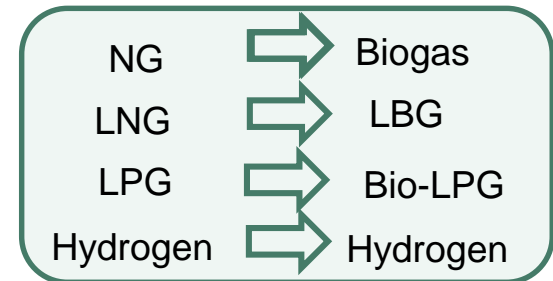
Industry 3 TWh



**Ambitious goal which requires measures along the
whole biogas value chain**

Energy gas - a the road to climate neutral industry

- **Gas is very important for**
 - iron- and steel production
 - food industry, mining and petrochemical industry
- **Gas meet industry's high demands**
 - Fuel availability
 - Clean fuel
 - Price
 - High temperatures
 - Easy to regulate
 - Lower GHG
- **Environmental regulation has been driver for conversion from oil to gas**
- **Tax exemption for biogas and "Green gas concept" + EU ETS important**

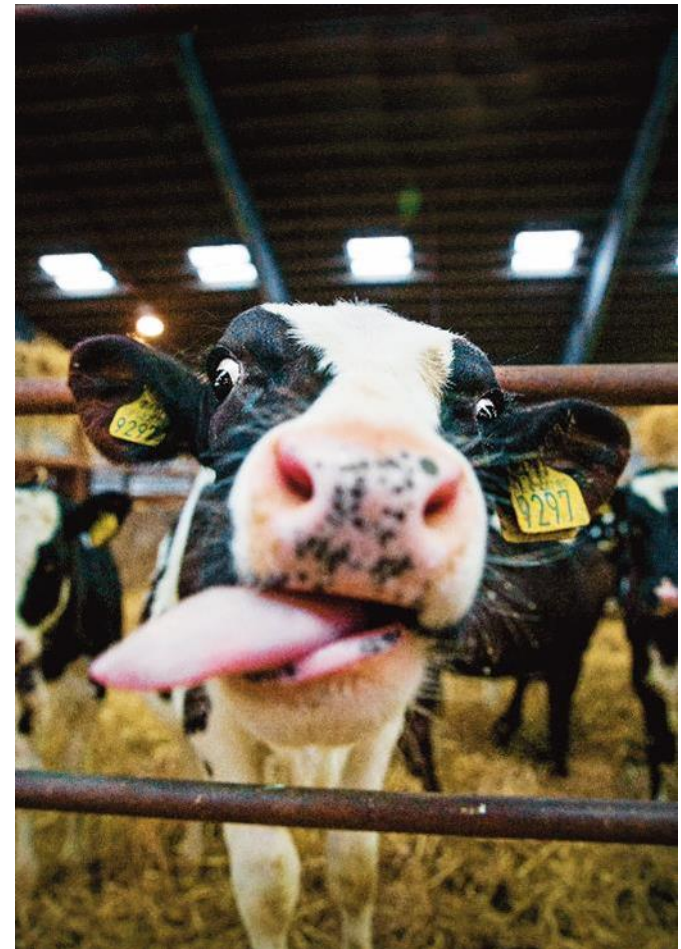


Same installations, distribution etc.



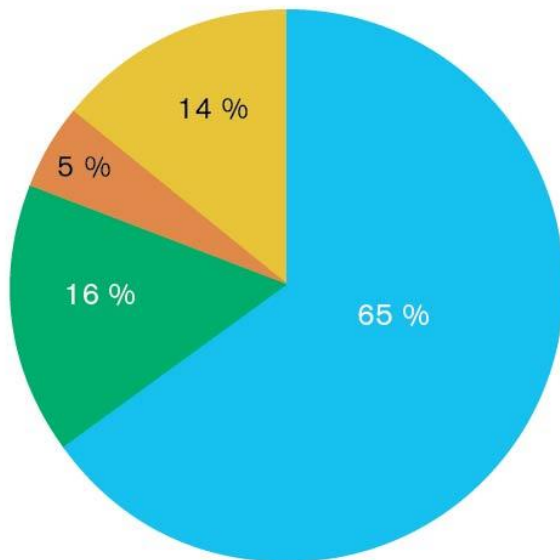
Biogas is coming!

- **Biogas use increased 30% during 2017 (again 2018?)**
- **Interest from industry has increased rapidly**
 - When the price is right it happens...
- **Vehicle gas (CNG) = 91 % biogas**
- **Large investments in LBG infrastructure**
 - Growing interest for LBG in heavy transport, sea transport and industry
- **Large investments in new (LBG) production foreseen**
- **Biogas market getting more international**
- **Government biogas committee is working (Biogasmärknadsutredningen)**
- **Several new policies favouring biogas**



Natural gas usage in 2017

percentage

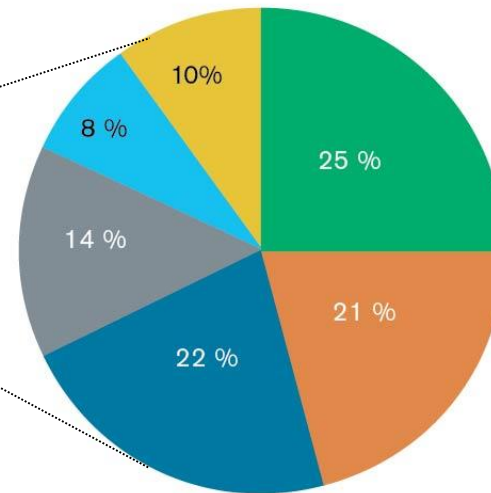


- Industry
- Power and heat (incl back pressure)
- Residential
- Other industries

Source: SCB

Natural gas usage in the industry 2017

percentage

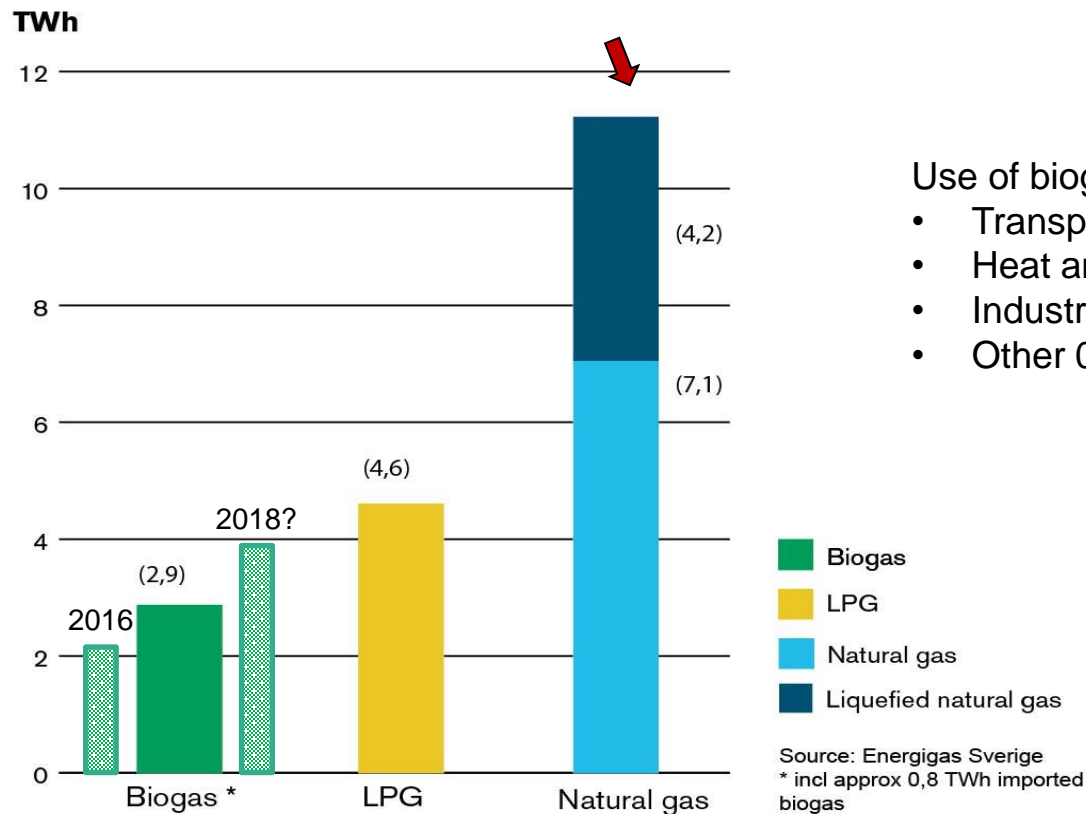


- Steel and Metal
- Food
- Chemistry (excl Petroleum refineries)
- Soil and stones
- Pulp and Paper
- Other industries


Source: SCB

Energy gas use in Sweden

Deliveries of energy gases in 2017



Use of biogas (estimate):

- Transport 1,4 TWh
 - Heat and electricity 0,6 TWh
 - Industry 0,6 TWh
 - Other 0,3 TWh
- 

Biogas in industry - large potential

- (Oil) → LNG → LBG is the key
 - Shipping
 - Industry (off grid)
 - Heavy vehicles
- Fossil gas in industry today:
> 10 TWh
- Industry & shipping:
 - Weaker economical incentives –
slower transition (?)

LNG infrastructure Northern Europe



Toyota Material Handling

- Toyota Material Handling in Mjölby has high ambitions as a sustainable and fossil free company
- From mid-2019 they will use 100% LBG in the painting process for the 130 000 trucks they produce every year
- 10-year-agreement with Svensk Biogas AB
 - up to 25 GWh LBG year
 - building a new LBG-plant
- Ambition to make all transports fossil free.



Trucklackering. Den flytande biogasen ska användas som bränsle för att driva tork- och härdugnar i målerierna.

FOTO: TOYOTA MATERIAL HANDLING

Arvid Nordqvist

- Arvid Nordqvist delivers 100% sustainable certified coffee since 2014
- 100 % biogas for roasting the coffee beans
 - delivered through Stockholm gas grid
- Reduced transports
- Reduced climate impact with 1 100 ton CO₂ per year



Other industry companies

- **Large gas consumers have started to mix natural gas with biogas in the production.**
- **Uddeholm (steel)**
 - A day on biogas 2018
- **Höganäs (steel)**
 - a biomass gasification demo plant (Cortus)
- **Perstorp (chemicals)**
 - Biogas used as raw material
- **Etc..**
- **Oil refineries future large biogas buyers?**
 - Example Preem:
Increased HVO production → increased hydrogen demand → higher NG demand (new NG reformer)
+ Ambitious GHG-reduction obligation → profitable to switch to biogas for H₂ production

Industry & biogas in symbiosis

- **Food industries, breweries, pulp industry, etc.**
 - engage in biogas production (6 existing plants...)
 - Spendrups, Domsjö, etc..
 - or delivers substrate (many)
- **Interesting new industry cooperations (circular solutions)**
 - Biokraft LBG plant in Trondheim (fish industry, pulp mill, manure...)
 - Gasum builds LBG plant at Stora Enso pulp mill in Nymölla
 - Rena Hav biogas plant in Sotenäs – waste from Orkla seafood industry
- **Long term agreements between a biogas producer and an industry – key for new investments?**
 - secure long term substrate input, or
 - secure long term biogas sales

Two priority measures

- Equal terms
 - competition on equal terms for imported and Swedish biogas must be assured quickly.
 - Long-term conditions
 - long-term and competitive conditions are required that apply for at least 10 years in the future. Must be decided in good time before 2021.
 - Support scheme should stimulate *both* production and use in *different* sectors
- + Remove existing barriers
- Example important for industry: Accept biogas from gas grid in the EU ETS (green gas principle)

Ongoing
Biogas market
investigation



Solution?
- A national biogas registry with
Guarantees of Origin!



Biogas



Thank you for listening!

- Visit [Gasdagarna 2019](#), Båstad 15-16 maj



www.energigas.se

linus.klackenbergh@energigas.se